



Indication of more satiating effect of milk compared to isocaloric sucrose-sweetened soft drink

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age BMI was 29.11 (SD = 6.65). Participants attended two sessions in counterbalanced order, one in which the VNS device was activated and another in which it was deactivated. During each session, participants were provided with 1600 calories of highly palatable foods and given ad libitum eating instructions. Caloric intake was calculated for each session. The difference in caloric intake between sessions was computed by subtracting calories consumed during deactivation from calories consumed during activation.

Results: Hierarchical multiple regression analyses controlling for disease and session order, demonstrated a significant effect of BMI on difference in caloric intake between sessions such that higher BMI was associated with increasing caloric intake from VNS inactivation to VNS activation ($R^2\Delta = 0.37$, $\beta = -0.63$, $t = -2.76$, $P = 0.02$).

Conclusion: Results extend previous research by showing that, in humans, VNS has a differential effect on food intake by body mass index.

Conflict of interest: None.

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Effects of slimming world's programme on dietary energy density

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Introduction: Diets of low energy density (ED) are beneficial in lowering energy intake and achieving weight loss. Slimming World's programme encourages the choice of, rather than prescribing, lower ED nutritionally balanced everyday foods. People can eat low ED foods to satiety *ad libitum*, rather than count calories. This study compared the ED of self-selected diets of Slimming World members to that of British consumers when following their normal diets, and prescribed intervention diets.

Methods: One hundred and seventeen slimming world members each completed a 3-d weighed food intake diary, on two occasions. In two previous studies, 132 people completed weighed food diaries: while consuming their habitual diets (control) and while consuming additional snack foods ($n = 72$, [1]); or additional fruits and vegetables (F&V, $n = 60$, [2]). ED was calculated for food only (i.e. excluding caloric and acaloric beverages).

Results: Habitual daily energy intakes of the slimming world, snacking and F&V studies were 6.4, 9.2 and 8.5 MJ respectively ($P < 0.001$ slimming world versus other diets). ED of the slimming world diet was significantly lower than the other habitual diets (4.8, 7.9 and 7.3 MJ/100 g⁻¹ respectively, $P < 0.001$). It was also significantly lower than the intervention diets of the other two studies, including where subjects were provided with 300 g or 600 g of F&V per day, (5.4 and 5.8 MJ/100 g⁻¹ respectively, $P \leq 0.003$).

Conclusion: Slimming world's programme enables people to self-select a significantly lower ED diet than either following a habitual diet or by increasing fruit and vegetable intake *per se* to reduce ED.

Conflict of interest: James Stubbs, Carolyn Pallister, Jenny Allan and Jacque Lavin work for Slimming World.

Funding: This work was co-funded by Slimming World and the EU sixth Framework Diogenes project FP6-513946.

References: 1. Whybrow S *et al.*, Effects of two-weeks' mandatory snack consumption on energy intake and energy balance, *Obesity Research*, 2007; 15(3): 673-85.

2. Whybrow S *et al.*, Effects of added fruits and vegetables on dietary intakes and body weight in Scottish adults, *British Journal of Nutrition*, 2006; 95: 496-503.

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Effect of a low glycemix index carbohydrate on adipose tissue and appetite regulation

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Introduction: We have investigated the effects of a low glycemix index (GI) saccharide on body adiposity and appetite regulation in a murine model of obesity.

Methods: Adult male C57BL/6 mice were maintained for 8 weeks on high fat (21%) isocaloric diets without saccharide (Control); or with supplementation of 7.5% (LD) or 20% saccharide (HD). Whole body fat content and distribution were assessed by MRI and MRS on a 4.7T Varian scanner ($n = 11/12$ per group). Hypothalamic brain activity ($n \geq 5$ per group) was assessed by manganese enhanced MRI (MEMRI) on a 9.4T scanner. A diet preference study was also performed by providing two diets (Control and HD diets, or LD and HD diets) simultaneously in one cage (4 mice per cage) for 5 days.

Results: Daily food intake for mice on LD diet was lower than Control and HD mice ($P < 0.001$). Body weight increases were lowest for mice on the LD diet and significantly different from the HD group ($P < 0.05$). Mice on the LD diet had significantly lower whole body ($P < 0.01$), subcutaneous ($P < 0.05$) and liver ($P = 0.05$) fat compared to Controls and mice on HD diet. MEMRI studies showed that the LD and HD groups had lower signal enhancement than Controls ($P < 0.01$) in various hypothalamic nuclei. The diet preference study indicated that animals preferred the HD over Control and LD diets.

Conclusion: We have showed that dietary supplementation with a low GI saccharide reduces body adiposity and hypothalamic brain activity associated with hunger and satiety particularly at the lower levels tested.

Conflict of interest: None.

Funding: Research relating to this abstract was funded by BENEO Group.

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Indication of more satiating effect of milk compared to isocaloric sucrose-sweetened soft drink

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Introduction: Energy intake (EI) from drinks may not be compensated for by proper satiety sensation which may be of importance for the association between e.g. sugar-sweetened soft drinks (SSSD) and obesity. Moreover, whether different energy containing drinks have different effect on the appetite is unknown.

Method: Twenty-four obese subjects (12 females) were investigated in an acute cross-over study. On four different days each of four drinks (500 ml) was served - (1) water, (2) aspartame-sweetened drink(ASD) (7.5 kJ), (3) skimmed milk (950 kJ), and (4) SSSD (900 kJ). Satiety score (VAS) and hormones regulating appetite (ghrelin, GLP1, GIP etc.) were collected over 30 minutes up to 4 hours where an *ad libitum* meal was served and the total EI calculated.

Results: Milk induced a 94% greater satiety than water whereas the effect of SSSD and ASD was not different from water. Ghrelin was lower after milk compared to water and the anorexic hormones, GLP-1 and GIP, was higher after milk both compared to SSSD (24-30% higher, $P < 0.001$) and compared to the two other drinks. There were no differences between water and ASD. The total EI

including the *ad libitum* meal was higher after the energy containing drinks – water (4781 kJ), ASD (5010 kJ) versus milk (5594 kJ) and SSSD (5824 kJ) ($P < 0.05$).

Conclusions: From this short term investigation there are indications both from VAS score and measurements of appetite-regulating hormones that milk may have more satiating effect than isocaloric SSSD. No differences between water and ASD were found. The energy consumed by both milk and SSSD was not compensated by reduced EI in the following *ad libitum* meal. Thus, energy containing drinks may play a role for developing of positive energy balance. More long term studies are, however, necessary to determine the clinical importance for the development of overweight/obesity.

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Blood lipid profile of prepubertal severe obese children

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Introduction: The dyslipidaemias are metabolic complications associated with obesity, mainly for severe obese people, adults or children. **Objective:** To evaluate blood lipid profile of severe obese children and correlate it with the cholesterol intake.

Methods: Severe obese children ($n = 57$, 31 boys) participated in the study. The 4 days food register method was used, as well as the *Virtual Nutri Software* to calculate the diets. The biochemical analyses (total cholesterol, CT; triglycerides, TG; HDL-c; LDL-c; VLDL-c) were done according to international standards. The medium of cholesterol intake and the values of the biochemical analyses were compared to the American Heart Association's parameters.

Results: The cholesterol intake showed excess in 30% of the children, (between 201.9 to 430 mg/day). This result indicates the contribution of animal food products on their diets. The majority of the children (74%) showed dyslipidaemias, once one or more of their serum lipids were out of normal values. High TC was observed in 59% of the cases; regarding TG, VLDL-c and LDL-c, high levels in respectively 54, 47 and 25% of children. Low HDL-c was showed by 47% of children. No statistic significance was observed between the intake of cholesterol and the LDL-c; on the contrary, it was observed correlation between cholesterol intake and VLDL-c ($P = 0.01$) and between it and the TG ($P = 0.003$).

Conclusion: The multidisciplinary monitoring, to promote the prevention and reversion of the metabolic complications is crucial to this vulnerable group.

Conflict of interest: None disclosed.

Funding: No funding.

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How interventions of physical activity could be extended to current diabetes care

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Introduction: Regular physical activity plays an important role in the prevention and treatment of diabetes and metabolic syndrome. The purpose of this review is to analyze randomized control trials assessing the effects of physical activity intervention on weight and A1C changes during 12 months or more in people with type 2 diabetes.

Methods: Studies used were published in the databases of PUBMED-MEDLINE, EBSCO and Scielo from January 2000 to November 2009.

Results: Eleven studies met the inclusion criteria. Eight of those studies (four on weight, two in A1C, one in waist circumference and diastolic blood pressure, one in total cholesterol and LDL cholesterol, and one in HOMA) found clinical improvement in the intervention group, and three others observed no significant differences.

Conclusions: Although these results are promising, there is a need of higher human and equipment infrastructure and resources to extend these results to the current diabetes care at primary care settings.

Conflict of interest: None disclosed.

Funding: No funding.

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Effects of a soluble dietary fiber supplementation with NUTRIOSE® on risk factors of the metabolic syndrome in Chinese male adults

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Introduction: Abdominal obesity is one key underlying risk factor of the metabolic syndrome (MS). The MS, and in particular overweight and hypertension, is widely influenced by dietary factors; and among them, supplementation with fiber. The impact of NUTRIOSE® a soluble dietary fiber, on some MS characteristics, was investigated in a clinical placebo controlled trial.

Methods: One hundred and twenty overweight Chinese male volunteers were enrolled in two groups receiving in beverage either 17 g NUTRIOSE® or 17 g standard maltodextrin at the same time, twice daily, for 12 weeks. Comparisons of body weight (BW), body mass index (BMI), body fat (BF), waist circumference (WC), caloric intake (CI), hunger feeling (HF) and systolic blood pressure (SBP) between the two groups at baseline and throughout the study were analyzed.

Results: Significant decreases in BW ($P < 0.0001$), BMI ($P < 0.0001$), BF ($P < 0.0001$) and HF ($P < 0.001$), associated with a decreased caloric intake ($P < 0.001$) were observed throughout the study in the NUTRIOSE® group, as well as a final significant reduction in WC as measured by abdominal scans ($P < 0.001$), while no changes were observed in the placebo group. There was no difference between groups for SBP.

Conclusion: Dietary intervention through NUTRIOSE® supplementation significantly modified hunger feeling and biological markers of MS, including body weight. This makes of NUTRIOSE® a promising tool for diet fortification with fibers, particularly in the context of weight management and chronic metabolic disorders associated with overweight.

Conflict of interest: None.

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Dose response evaluation of the effects of NUTRIOSE® on satiety and weight management

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Introduction: A resistant dextrin, NUTRIOSE® (Roquette, France), has previously shown positive impacts on hunger feeling and weight management at a daily dosage of 34g/day orally. In this second study, we investigated whether NUTRIOSE® could have a dose-related positive impact on some satiety-related and anthropometric parameters.

Methods: In a randomized, placebo-controlled, double blind, parallel, single-center trial, five groups of 20 Chinese adult volunteers ($24 \leq \text{BMI} \leq 28 \text{ kg/m}^2$) ingested orange juice twice daily for 9 weeks either alone (Placebo) or supplemented with NUTRIOSE®.